FOLDABLE BACKLIT DISPLAY AND DEVICE HAVING THE SAME

CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority of Taiwanese Patent Application No. 100109531, filed on Mar. 21, 2011, the disclosure of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a display, and more particularly to a display that is movable between folded and unfolded positions and an electronic device having the same.

2. Description of the Related Art

Currently, through the design of a flexible display panel in a portable electronic device, a housing of the electronic device can simultaneously move the flexible display panel between folded and unfolded positions. However, how to conceptualize a structural design such that a backlight module can provide uniform light to the flexible display panel when the flexible display panel is in the unfolded position becomes the subject of improvement of the present invention.

SUMMARY OF THE INVENTION

Therefore, an object of the present invention is to provide a display and an electronic device having the same. When the display is in an unfolded position, a backlight module can provide uniform light to a flexible display panel, so that the flexible display panel can display uniform brightness or luminosity.

The purpose of the present invention and the solution to the conventional technical problems are achieved through employment of the below technical means. According to one aspect of disclosure of the present invention, a display comprises an outer casing, two backlight modules, and a flexible display panel.

The outer casing includes at least one connecting member and two casing panels. The connecting member has two connecting ends respectively disposed at left and right sides thereof. The casing panels are connected respectively to the connecting ends, and respectively have bonding faces. The two backlight modules are disposed respectively on the bonding faces of the casing panels. The flexible display panel includes two side panel sections disposed respectively on the backlight modules, and a foldable intermediate section connected between the side panel sections. The casing panels are pivotal relative to each other to move the backlight modules and the flexible display panel to an unfolded position. The backlight modules coplanarly cover a backside of the flexible display panel in the unfolded position.

According to another aspect of this invention, an electronic device comprises a display and an electronic control unit. The display includes an outer casing, two backlight modules, and a flexible display panel.

The outer casing includes at least one connecting member and two casing panels. The connecting member has two connecting ends respectively disposed at left and right sides thereof. The casing panels are connected respectively to the connecting ends, and respectively have bonding faces. The two backlight modules are disposed respectively on the bonding faces of the casing panels. The flexible display panel includes two side panel sections disposed respectively on the backlight modules, and a foldable intermediate section connected between the side panel sections. The casing panels are pivotal relative to each other to move the backlight modules and the flexible display panel to an unfolded position. The backlight modules coplanarly cover a backside of the flexible display panel in the unfolded position. The electronic control unit includes a coupling frame connected to one end of one of the casing panels, which is opposite to the connecting member, a control module disposed on the coupling frame, and a soft circuit board connected electrically to the control module, the backlight modules, and the flexible display panel.

The coupling frame includes a carrier plate carrying the control module, and a coupling member connected pivotally to the carrier plate and one of the casing panels. In the folded position, the control module and the carrier plate are disposed between the side panel sections of the flexible display panel.

Through the aforesaid technical means, the advantage and efficiency of the electronic device having the display of the present invention reside in that through the connection of the connecting member between the casing panels, when the two casing panels are pivoted to the unfolded position, the casing panels can move the backlight modules to coplanarly cover the backside of the flexible display panel. Through this configuration, the backlight modules can provide uniform light to the flexible display panel, which in turn, can display uniform brightness or luminosity.

BRIEF DESCRIPTION OF THE DRAWINGS

Other features and advantages of the present invention will become apparent in the following detailed description of the embodiments of the invention, with reference to the accompanying drawings, in which:

FIG. **1** is a perspective view of an electronic device having a display according to the first embodiment of the present invention in a folded state;

FIG. **2** is a perspective view of the first embodiment in an unfolded state;

FIG. **3** is an exploded perspective view of the first embodiment;

FIG. **4** is a sectional view of the first embodiment, illustrating how a foldable intermediate section of a flexible display panel is folded when two casing panels of an outer casing of the display are in a folded position;

FIG. **5** is a schematic view of the first embodiment, illustrating a retaining element engaging a first positioning hole in a connecting member of the outer casing when the casing panels are in the folded position;

FIG. **6** is a fragmentary sectional view of the first embodiment, illustrating how the retaining element engages the first positioning hole when the casing panels are in the folded position;

FIG. **7** is a sectional view of the first embodiment, illustrating how the casing panels are moved to an unfolded position;

FIG. **8** is a sectional view of the first embodiment, illustrating two backlight modules coplanarly covering a backside of the flexible display panel when the casing panels are in the unfolded position;

FIG. **9** is a schematic side view of the first embodiment, illustrating the retaining element engaging a second positioning hole in the connecting member of the outer casing when the casing panels are in the unfolded position;

FIG. **10** is a fragmentary sectional view, illustrating how the retaining element engages the second positioning hole when the casing panels are in the unfolded position;